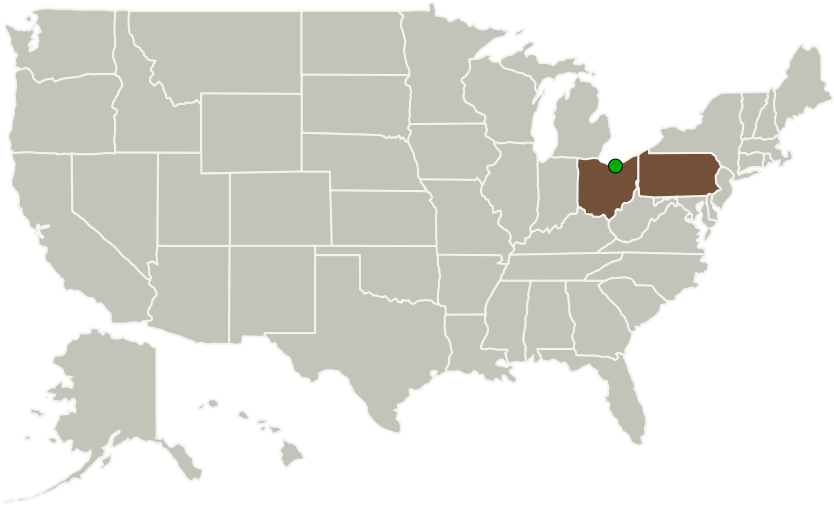
Low Cost Radiator for Fission Power Thermal Control, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

NASA Glenn Research Center (GRC) is developing fission power system technology for future space transportation and surface power applications. The early systems are envisioned in the 10 to 100kWe range and have an anticipated design life of 8 to 15 years with no maintenance. A non-nuclear system ground test in thermal-vacuum is planned by NASA GRC to validate technologies required to transfer reactor heat, convert the heat into electricity, reject waste heat, process the electrical output, and demonstrate overall system performance. This SBIR project by ACT will develop a single-facesheet Variable Conductance Heat Pipe (VCHP) radiator, operating near 450K, to support the Technology Demonstration Unit (TDU) for surface power and 100kW-class electric vehicles. ACT will utilize the experience gained during previous Phase I and Phase II VCHP radiator programs for NASA GRC to increase the specific power of the radiator and reduce the overall cost. A trade study will be conducted to compare single-facesheet and dual-facesheet VCHP radiator designs and the ability to directly bond a GFRC facesheet to a titanium heat pipe will be demonstrated. A complete preliminary design for a single-facesheet VCHP radiator for the non-nuclear system will be developed at the end of the Phase I program.

Primary U.S. Work Locations and Key Partners



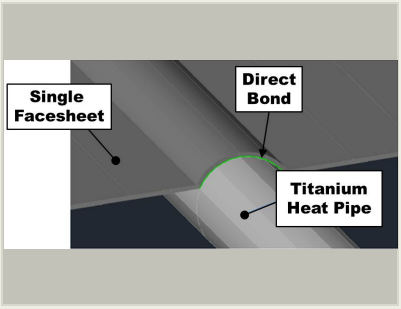


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Advanced Cooling Technologies, Inc.	Lead Organization	Industry	Lancaster, Pennsylvania
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Pennsylvania

Project Transitions

May 2013: Project Start

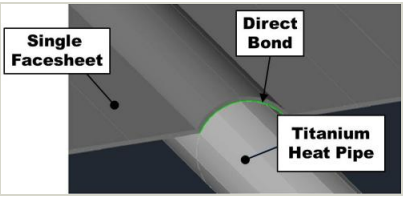
November 2013: Closed out

Closeout Summary: Low Cost Radiator for Fission Power Thermal Control, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/140419)*

Images



Briefing Chart Image
Low Cost Radiator for Fission Power Thermal Control, Phase I
(https://techport.nasa.gov/image/130322)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Advanced Cooling Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

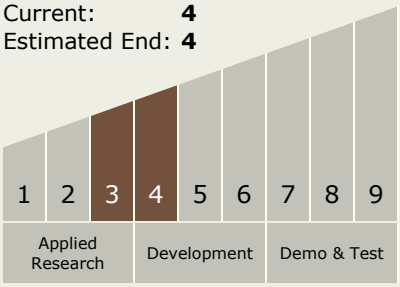
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Calin Tarau Tarau

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2013 - 2013)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System